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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/690,179	10/20/2003	Seung Eon Moon	51876P400	3926

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EXAMINER

AUSTIN, AARON

ART UNIT	PAPER NUMBER
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1775

MAIL DATE	DELIVERY MODE
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05/02/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/690,179	Applicant(s) MOON ET AL.	
	Examiner Aaron S. Austin	Art Unit 1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 8 and 9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 8 and 9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/12/07 has been entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-2 and 8-9 are rejected under 35 U.S.C. 102(a) as being anticipated by Moon et al. ("Orientation Dependent microwave dielectric properties of ferroelectric BST thin films" – see the IDS of 10/20/03).

Moon et al. disclose ferroelectric/dielectric BST thin films oriented in a (111) direction grown on MgO by pulsed laser deposition and having the characteristics of an interdigital capacitor.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunt et al. (US 7,145,412).

Hunt et al. teach an apparatus comprising a microwave tunable device (col. 4:27). The device may include an MgO substrate (col. 9:22). A BST ferroelectric/dielectric layer is deposited on the substrate (col. 8:59-60). An interdigital single layer electrode pattern is formed on the BST layer and separated from the MgO substrate (col. 5:61-64).

Hunt does not teach the BST film as being oriented in a (111) direction when applied to an MgO substrate. However, Hunt does teach an embodiment wherein the substrate is c-plane sapphire and the BST applied thereto is in the (111) orientation (col. 14:1-3). Therefore, as Hunt clearly teaches BST applied in the (111) direction provides the advantage of a ferroelectric/dielectric with the benefits of the taught invention and MgO is a suitable alternative substrate for application of BST (col. 14:1-3 and col. 9:22), it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to form the BST film in the (111) direction on the other substrates taught, including MgO. Thus the claimed invention as a whole is *prima facie* obvious over the combined teachings of the prior art.

Regarding claims 1 and 8, the recitation of "a phase array antenna system" and "a satellite communication system" is considered intended use. In addition, devices as taught by Hunt et al. are known components of phase array antenna systems and satellite communication systems.

Regarding claims 2 and 9, the BST film completely covers the substrate (Fig. 17).

Claims 1-2 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunt et al. (US 7,145,412) in view of Moon et al. ("Orientation Dependent microwave dielectric properties of ferroelectric BST thin films" – see the IDS of 10/20/03).

Hunt et al. teach an apparatus as described above.

Hunt does not teach the BST film as being oriented in a (111) direction when applied to an MgO substrate.

In addition to the argument set forth above, Moon et al. teach ferroelectric/dielectric BST thin films oriented in a (111) direction grown on MgO by pulsed laser deposition and having the characteristics of an interdigital capacitor. Therefore, as Hunt clearly teaches BST applied in the (111) direction provides the advantage of a ferroelectric/dielectric with the benefits of the taught invention and as Moon et al. teach BST may be applied in the (111) direction to MgO with the benefit of a large dielectric Q value, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to form the BST film in the (111) direction on the other

substrates taught, including MgO. Thus the claimed invention as a whole is *prima facie* obvious over the combined teachings of the prior art.

Regarding claims 1 and 8, the recitation of "a phase array antenna system" and "a satellite communication system" is considered intended use. In addition, devices as taught by Hunt et al. are known components of phase array antenna systems and satellite communication systems.

Regarding claims 2 and 9, the BST film completely covers the substrate (Fig. 17).

Response to Arguments

Applicant's arguments, see the Remarks, filed 4/12/07, with respect to the rejections implementing the Chang reference have been fully considered and are persuasive. These rejections have been withdrawn.

Applicant's arguments filed 4/12/07 with respect to the Hunt reference alone have been fully considered but they are not persuasive.

Applicant first argues Hunt's disclosure of deposition of BST on c-plane sapphire wherein the crystalline lattice is (1,1,1) does not make it obvious to grow a BST oriented in a (1,1,1) direction on an MgO substrate. However, Hunt does disclose magnesium oxide may serve as a suitable alternative for sapphire (column 9, lines 20-23). As such, it would be obvious to one of ordinary skill in the art to replace the c-plane sapphire with MgO for deposition of the BST in reading the teachings of Hunt.

Second, applicant argues Hunt does not teach growing of the BST by pulsed laser ablation. However, this requirement of the claims is considered indicative of product by process language. The above arguments establish a rationale tending to show the claimed product is the same as what is taught by the prior art. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 227 USPQ 964,966. Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP 2113. It is not clear as to whether there is a patentably distinct structural difference between layers formed by pulsed laser ablation versus CVD. Evidence supporting any differences is requested.

Third, applicant argues none of the Examples provided by Hunt use MgO as a substrate. However, this is not considered to be limiting as Hunt teaches MgO is suitable as a substrate (column 9, lines 20-23).

Fourth, applicant argues that the assertion in the prior Office Action that "Hunt does not teach the BST film as being in a (111) direction when applied to an MgO

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substrate" contradicts the rejection. However, the rejection does not assert the specific claim limitations are taught, as would be suitable under 35 USC 102, but instead surmises it would be obvious to one of ordinary skill in the art at the time of the claimed invention to form the BST film in the (111) direction on the other substrates taught including MgO as the substrate rather than sapphire, as Hunt clearly teaches BST applied in the (111) direction provides the advantage of a ferroelectric/dielectric with the benefits of the taught invention and MgO is a suitable alternative substrate for application of BST. Even further, rejections may be written in the alternative using alternative interpretations.

Fifth, in response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In the present case, the knowledge relied upon is supplied by Hunt and as described above, not applicant's disclosure.

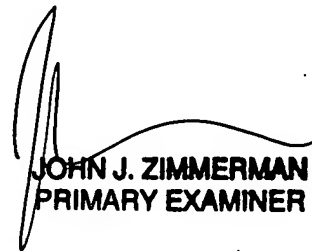
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron S. Austin whose telephone number is (571) 272-8935. The examiner can normally be reached on Monday-Friday: 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ASA



JOHN J. ZIMMERMAN
PRIMARY EXAMINER